

Claims

1. A method for reporting a streaming quality, wherein at least one continuous media stream is streamed to a client (601), and wherein said streaming is controlled by a protocol (109) that is operated between said client (601) and a server (600), comprising:
 - selecting (602) at least one quality metric and a quality metrics class from a pre-defined set of at least two quality metrics classes, and
 - reporting (603) to said server (600) the quality of said streaming based on said at least one selected quality metric and said selected quality metrics class.
2. The method according to claim 1, wherein said step of selecting (602) said quality metrics class comprises the step of negotiating (605-609) said quality metrics class between said client (601) and said server (600).
3. The method according to any of the claims 1-2, wherein said protocol (109) defines a quality metrics class field within at least one of its protocol data units, wherein said quality metrics class field is capable of identifying each quality metrics class of said pre-defined set of at least two quality metrics classes.
4. The method according to claim 3, wherein said quality metrics class field is located in a header section (3) of said at least one protocol data unit.

5. The method according to any of the claims 1-4, wherein said at least one selected quality metric is a Quality of Experience (QoE) metric that is at least partially based on the decision whether at least one frame of said at least one continuous media stream is a good frame.
6. The method according to claim 5, wherein each quality metrics class in said pre-defined set of at least two quality metrics classes defines a different set of rules on how to decide whether a frame of said at least one continuous media stream is a good frame.
7. The method according to claim 6, wherein said set of rules defined by at least one of said quality metrics classes comprises:
 - deciding the earlier of
 - a completely received I-frame of said at least one continuous media stream or
 - the N-th completely received frame of said at least one continuous media stream after last frame error or loss
 - to be a good frame, wherein the integer N is either signalled or defaults to ∞ in case of a video frame or 1 in case of an audio frame, and
 - deciding a frame of said at least one continuous media stream following a good frame to be a good frame, if said frame is completely received, and said frame and all subsequent frames until the next good frame to be corrupted, otherwise.

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8. The method according to claim 6, wherein said set of rules defined by at least one of said quality metric classes comprises:

- deciding a coded frame of said at least one continuous media stream to be a good frame according to an error tracking algorithm.

9. The method according to claim 8, wherein said set of rules defined by at least one of said quality metrics classes comprises:

- deciding an intra-coded frame of said at least one continuous media stream to be a good frame, if it is completely received at said client, and to be a corrupted frame otherwise, or
- deciding a predictively coded frame of said at least one continuous media stream to be a good frame, if it is completely received at said client and if all its prediction reference samples belong to good frames, and to be a corrupted frame otherwise.

10. The method according to claim 6, wherein said set of rules defined by at least one of said quality metrics classes comprises:

- deciding a coded frame of said at least one continuous media stream to be a good frame according to a decoding quality evaluation algorithm.

11. The method according to claim 10, wherein said set of rules defined by at least one of said quality metrics classes comprises:

- deciding an intra-coded frame of said at least one continuous media stream to be a good frame, if it is

completely received at said client, and to be a corrupted frame otherwise, or

- deciding a predictively coded frame of said at least one continuous media stream to be a good frame, if it is completely received at said client and all of its prediction reference samples belong to good frames, or if at least a part (403) of said frame is completely received, all prediction reference samples of said completely received parts of said frame belong to good frames, and all concealed parts (402) of said frame are considered as good, wherein concealed parts (402) of said frame are obtained by applying an error concealment algorithm to lost or erroneous parts (400, 404) of a decoded version of said frame, and wherein said concealed parts (403) are considered as good if an average boundary difference between (502a-d) said concealed parts (402, 503) and surrounding completely received (403, 504) and decoded parts of said frame is below a threshold.

12. The method according to any of the claims 1-11, wherein said protocol (109) is a Real-time Streaming Protocol RTSP (109) in combination with a Session Description Protocol SDP (110) in the context of a Packet-Switched Streaming Service PSS of a third generation mobile communications system.

13. The method according to claim 12, wherein said SDP (110) comprises at least one SDP attribute that defines at least one quality metrics class field, wherein said quality metrics class field is capable of identifying

each quality metrics class of said pre-defined set of at least two quality metrics classes.

14. The method according to claim 13, wherein said RTSP (109) is used to negotiate a quality metrics class between said client (601) and said server (600) at least partially based on said SDP attribute.

15. The method according to claim 14, wherein said RTSP (109) uses a DESCRIBE method for said negotiation.

16. A computer program with instructions operable to cause a processor to perform the method steps of claims 1-15.

17. A computer program product comprising a computer program with instructions operable to cause a processor to perform the method steps of claims 1-15.

18. A streaming system, comprising:

- at least one client (601), and
- at least one server (600),
wherein at least one continuous media stream is streamed to said at least one client (601), and wherein said streaming is controlled by a protocol (109) that is operated between said at least one client (601) and said at least one server (600), wherein at least one quality metric and a quality metrics class from a pre-defined set of at least two quality metrics classes are selected, and wherein the quality of said streaming based on said at least one selected quality metric and

said selected quality metrics class is reported to said at least one server (600).

19. A client (601) in a streaming system, comprising:

- means (701) for operating a protocol (109) that controls a streaming of at least one continuous media stream to said client (601),
- means (701) for selecting at least one quality metric and a quality metrics class from a pre-defined set of at least two quality metrics classes, and
- means (701) for reporting the quality of said streaming based on said at least one selected quality metric and said selected quality metrics class to a server (600).

20. A server (600) in a streaming system, comprising:

- means (700) for operating a protocol (109) that controls a streaming of at least one continuous media stream to a client (601),
- means (700) for selecting at least one quality metric and a quality metrics class from a pre-defined set of at least two quality metrics classes, and
- means (700, 706) for receiving a reported quality of said streaming from said client (601), wherein said quality is reported based on said at least one selected quality metric and said selected quality metrics class.

21. A protocol (109) for a streaming system, comprising:

- rules for the control of a streaming of at least one continuous media stream to a client (601),
- a definition of at least one quality metric and of a set of at least two quality metrics classes,

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- rules for the selection of at least one quality metric and of a quality metrics class from said set of at least two quality metrics classes, and
- rules for the report of a quality of said streaming based on said at least one selected quality metric and said selected quality metrics class to a server (600).